

REMARKS

Claims 1-49 are pending. Claims 1, 17, 26, 33, 36, 42, and 46 are in independent form.

CLAIM 1

Claim 1 was rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,360,282 to Langerman et al. (hereinafter "Langerman").

As amended, claim 1 relates to a machine-implemented method that includes receiving, by a first process in a first user virtual memory address space, a shortcut to a physical address associated with a level of a multi-level virtual address translation table, posting a descriptor to an interface between the first process and a second process, and determining, by the second process, the physical address corresponding to the virtual address based on at least the virtual address and the shortcut. The descriptor includes a virtual address in the first user virtual memory address space and the shortcut. The second process is in a second user virtual memory address space.

As best understood, the rejection of claim 1 is based on the contention that Langerman's virtual interface constitutes an interface between a first process and a second process, as recited in claim 1.

Applicant respectfully disagrees. Langerman's virtual interface is between an application program and a storage entity. See, e.g., *Langerman*, col. 2, line 48-49. See also *Langerman*, col. 3, line 64 - col. 4, line 2 (describing that an adapter 16 provides an interface between a system bus and storage busses to which storage devices 22 are attached).

Applicant respectfully submits that an interface between an application program and a storage entity is not an interface between a first process and a second process, as required of the interface recited in claim 1. In this regard, a storage entity is not a process. For example, a storage entity such as Langerman's is not "in" a virtual memory address space, as are the processes recited in claim 1. Since one of ordinary skill would not reasonably consider a storage entity to be a process, the rejection of claim 1 is deficient and Applicant requests that it be withdrawn.

Moreover, claim 1 has been amended to recite that the first process is in a first user virtual memory address space and that the second process is in a second user virtual memory address space. Even if *arguendo* Langerman's adapter manager 32 were to be considered a process as recited in claim 1, Langerman makes it clear that adapter manager 32 is a kernel process. See *Langerman*, col. 5, line 28-31. Adapter manager 32 would thus appear to execute in kernel virtual memory space.

Accordingly, claim 1 is not anticipated by Langerman. Applicant requests that the rejections of claim 1 and the claims dependent therefrom be withdrawn.

CLAIM 17

Claim 17 was rejected under 35 U.S.C. § 102(b) as anticipated by Langerman.

As amended, claim 17 relates to a machine-implemented method. The method includes generating, by a first user process in a first user virtual memory address space, a request to register a virtual buffer, identifying a block of memory that includes the physical address corresponding to the start of the virtual buffer, generating, by a second process, one or more shortcuts that map the block of memory that includes the physical address corresponding to the start of the virtual buffer, and transmitting a request to a third user process in a second user virtual memory address space to perform an input or output operation on the virtual buffer. The virtual buffer is in the first user virtual memory address space and is mapped to physical memory by a multi-level virtual address translation table associated with the first process.

As best understood, the rejection of claim 17 is based on the contention that the multiple users of Langerman's interface somehow constitute first and third processes as recited in claim 17. *See, e.g., Office action mailed November 2, 2006, page 16, para. 26.*

Applicant respectfully disagrees. As discussed in the response filed August 21, 2006, although Langerman's software interface supports multiple concurrent users (*See Langerman, col. 4, line 14-20*), Langerman does not establish an interface between those users. Indeed, one of Langerman's stated purposes is to prevent a user program from gaining unauthorized access to another user's registers. *See Langerman, col. 4, line 21-24.* To prevent such unauthorized access, Langerman's adapter verifies that descriptors and data buffers identified by virtual memory address information in the queue of the virtual interfaces are located within the registered virtual memory region registered in those virtual interfaces. *See, e.g., Langerman, col. 2, line 66 - col. 3, line 7.*

Since Langerman does not allow user programs to gain access to other user's registered spaces, Langerman neither describes nor suggests the transmission of a request to a third user process to perform an input or output operation on a virtual buffer that was registered at the request of a first user process, as recited in claim 17.

Accordingly, claim 17 is not anticipated by Langerman. Applicant requests that the rejections of claim 17 and the claims dependent therefrom be withdrawn.

CLAIM 26

Claim 26 was rejected under 35 U.S.C. § 102(b) as anticipated by Langerman.

As amended, claim 26 relates to a system that includes a first processor and a second processor. The first processor is capable of executing instructions of a first process which causes the first processor to produce a shortcut to a physical address associated with a level of a multi-level virtual address translation table, and executing instructions of a second user process in a first user virtual memory address space which causes the first processor to post a descriptor comprising a virtual address and the shortcut to an interface. The second processor capable of executing instructions of a third user process in a second user virtual memory address space which cause the second processor to read the descriptor posted on the interface, and determine a physical address of the virtual address based on at least the virtual address and the shortcut. The interface is between the second process and the third process.

The rejection of claim 26 is based on the contention that Langerman's virtual interface constitutes an interface between a second process and a third process, as recited in claim 26.

Applicant respectfully disagrees. As discussed above, Langerman's virtual interface is between an application program and a storage entity. However, a storage entity is not a process. Since one of ordinary skill would not reasonably consider a storage entity to be a process, the rejection of claim 26 is deficient and Applicant requests that it be withdrawn.

Moreover, claim 26 has been amended to recite that the second process is in a first user virtual memory address space and that the third process is in a second user virtual memory address space. Even if *arguendo* Langerman's adapter manager 32 were to be considered a process as recited in claim 26, Langerman makes it clear that adapter manager 32 is a kernel process and adapter manager 32 is therefore understood to execute in kernel virtual memory space.

Accordingly, claim 26 is not anticipated by Langerman. Applicant requests that the rejections of claim 26 and the claims dependent therefrom be withdrawn.

CLAIM 33

Claim 33 was rejected under 35 U.S.C. § 102(b) as anticipated by Langerman.

As amended, claim 33 relates to a computer program product residing on a computer readable medium having instructions stored thereon. When the instructions are executed by the processor, the instructions cause that processor to produce a shortcut to a physical address associated with a level of a multi-level virtual address translation table, and write a descriptor comprising a virtual address and the shortcut to an interface between a first user process in a first user virtual memory address space and a second user process in a second user virtual memory address space.

The rejection of claim 33 is based on the contention that Langerman's virtual interface constitutes an interface between a first process and a second process, as recited in claim 33.

Applicant respectfully disagrees. As discussed above, Langerman's virtual interface is between an application program and a storage entity. However, a storage entity is not a process. Since one of ordinary skill would not reasonably consider a storage entity to be a process, the rejection of claim 33 is deficient and Applicant requests that it be withdrawn.

Moreover, claim 33 has been amended to recite that the first user process is in a first user virtual memory address space and that the second user process is in a second user virtual memory address space. Even if *arguendo* Langerman's adapter manager 32 were to be considered a process as recited in claim 33, Langerman makes it clear that adapter manager 32 is a kernel process and adapter manager 32 is therefore understood to execute in kernel virtual memory space.

Accordingly, claim 33 is not anticipated by Langerman. Applicant requests that the rejections of claim 33 and the claims dependent therefrom be withdrawn.

CLAIM 36

Claim 36 was rejected under 35 U.S.C. § 102(b) as anticipated by Langerman.

As amended, claim 36 relates to a computer program product residing on a computer readable medium having instructions stored thereon. When the instructions are executed by a processor performing operations in a first user virtual memory address space, they cause that processor to read a message posted on an interface by a first user process in a different user virtual memory address space, the message including a shortcut to a physical address associated with a level of a multi-level virtual address translation table, determine a physical address of a virtual address in the different user

virtual memory address space based on at least the virtual address and the shortcut, and transmit a message over a network based on contents of the physical address.

The rejection of claim 36 is based on the contention that one of Langerman's user processes can read a message posted on an interface by a different user process in a different virtual memory address space, and transmit a message over a network based on contents of a physical address that was determined, at least in part, based on contents of the message, as recited in claim 36.

Applicant disagrees with both contentions. As discussed above, although Langerman's software interface supports multiple concurrent users, Langerman does not establish an interface between those users. Indeed, Langerman prevents unauthorized access of a user's registers by another user program by verifying that descriptors and data buffers identified by virtual memory address information in the queue of the virtual interfaces are located within the registered virtual memory region registered in those virtual interfaces.

Since Langerman does not allow user programs to gain access to other user's registered spaces, Langerman neither describes nor suggests that processor read a message posted on an interface by a different user process in a different virtual memory address space, and transmit a message over a network

based on contents of a physical address that was determined, at least in part, based on contents of the message.

Please note that Langerman's adapter manager 32 also cannot perform such reading and transmission, as contended at page 16, para. 27 of the Office action mailed November 2, 2006. In this regard, adapter manager 32 is part of Langerman's virtual interface between an application program and the remote storage devices described at col. 9, line 49-50. Thus, while adapter manager 32 may be part of the retrieval of stored contents from a remote physical address, adapter manager 32 does not transmit a message over a network based on contents of a physical address, as required of the processor in claim 36.

Moreover, claim 36 has been amended to recite that the instructions are executed by a processor performing operations in a first user virtual memory address space. However, Langerman makes it clear that adapter manager 32 is a kernel process. Adapter manager 32 is thus understood to execute in kernel virtual memory space.

Accordingly, claim 36 is not anticipated by Langerman. Applicant requests that the rejections of claim 36 and the claims dependent therefrom be withdrawn.

CLAIMS 42 AND 46

Claims 42 and 46 were rejected under 35 U.S.C. § 102(b) as anticipated by Langerman.

As amended, claim 42 relates to a system that includes a client computer and a server in communication with the client computer using a network. The server includes a first processor and a second processor. The first processor is capable of producing a shortcut to a physical address associated with a level of a multi-level virtual address translation table and writing a descriptor comprising a virtual address in a first user virtual memory address space and the shortcut to an interface. The second processor is capable of performing operations in a second user virtual memory address space, the operations including reading the descriptor posted on the interface, determining a physical address of the virtual address based on at least the virtual address and the shortcut, and transferring data located at the physical address to the client computer using the network.

As amended, claim 46 relates to a system that includes a storage device and a server in communication with the storage device over a network. The server of claim 46 is otherwise comparable to the server of claim 42.

As best understood, the rejections of claims 42 and 46 are based on the contention that the multiple users of Langerman's interface are performed at first and second processors and that a virtual address in a first virtual memory address space is used by one of Langerman's users in a second user virtual memory address space in determining a physical address of the virtual address. Moreover, this user is to transfer data located at the physical address to a client computer.

Applicant respectfully disagrees. As discussed previously, Langerman does not establish an interface between his multiple users. Indeed, Langerman prevents unauthorized access of a user's registers by another user program by verifying that descriptors and data buffers identified by virtual memory address information in the queue of the virtual interfaces are located within the registered virtual memory region registered in those virtual interfaces.

Since Langerman does not allow user programs to gain access to other user's registered spaces, Langerman neither describes nor suggests that a user in one virtual memory address space determine a physical address of the virtual address in a second virtual memory address space and transfer data located at the physical address to the client computer using the network. Instead, Langerman seeks to prevent unauthorized access of a user's registers by another user program.

Moreover, claims 42 and 46 have been amended to recite that the second processor can perform operations in a second user virtual memory address space. Langerman makes it clear that adapter manager 32 is a kernel process. Adapter manager 32 is thus understood to execute in kernel virtual memory space and cannot constitute such operations.

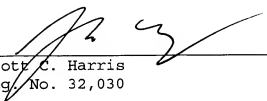
Accordingly, claims 42 and 46 are not anticipated by Langerman. Applicant requests that the rejections of claims 42, 46, and the claims dependent therefrom be withdrawn.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicant asks that all claims be allowed. No fees are believed due at this time. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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